Industry experience in good practice: Offshore systems

Seriola-Cobia Aquaculture Dialog

September 24-25, 2009

By: Neil Anthony Sims, M.Sc. President, CEO, Kona Blue email: neil@kona-blue.com

Industry experience in good practice: responsible Open Ocean Mariculture

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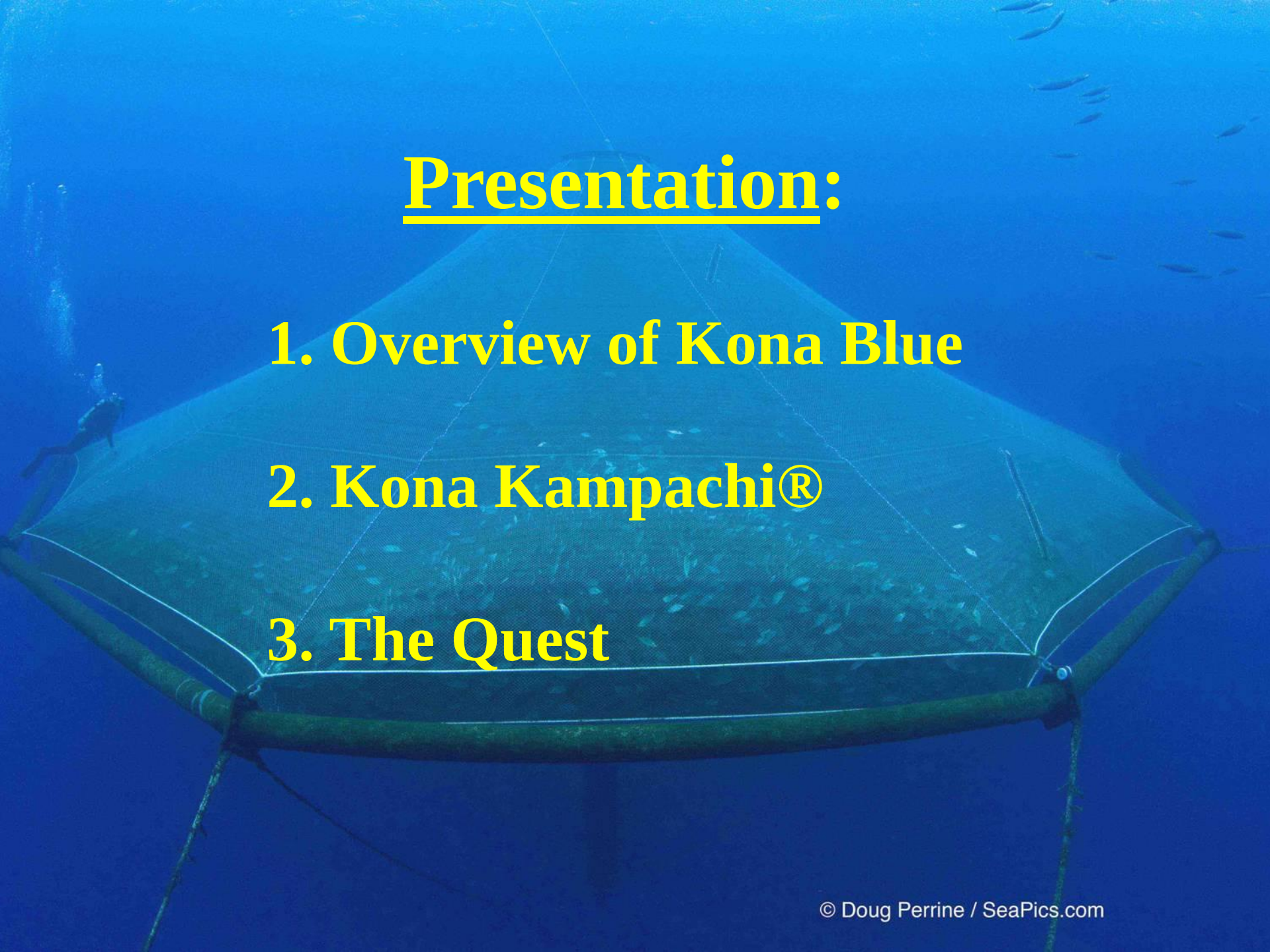
Presentation:
1. Overview of Kona Blue
2. Kona Kampachi®
3. The Quest
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Presentation:

1. Overview of Kona Blue

2. Kona Kampachi®

3. The Quest

Kona Blue's mission is to expand the environmentally sound production of the ocean's finest fish.

Pioneering and promoting sustainable aquaculture;

Producing and selling nutritious marine fish; and

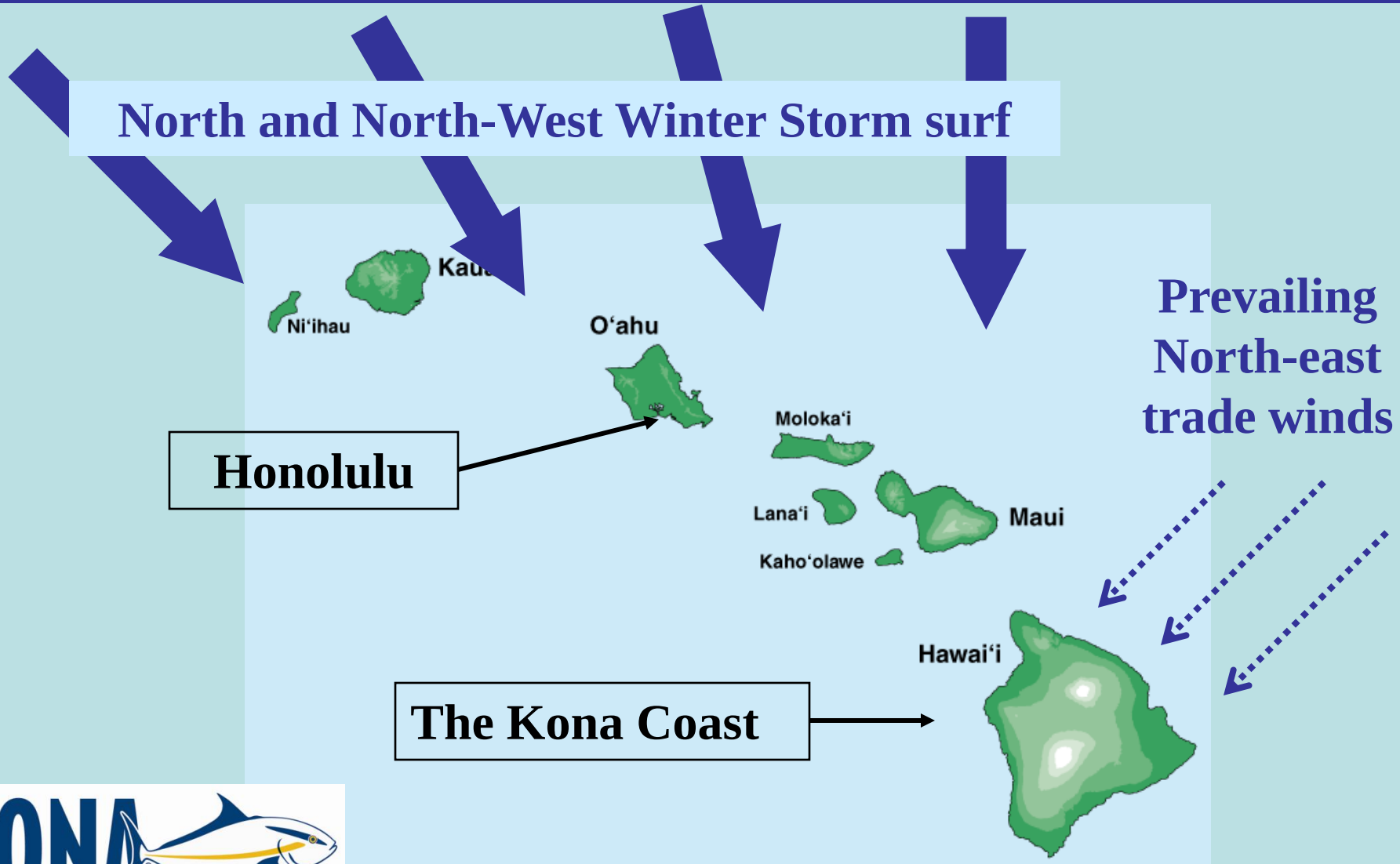
Building Kona Blue as the world's leading brand of premium farmed fish.

Why open ocean ?

- Minimal conflicts with other user groups
- Deeper water – minimal environmental impacts
- Improved water quality – healthy, high-quality fish

= The opportunity to culture superb products in pristine waters

Location : The Kona Coast



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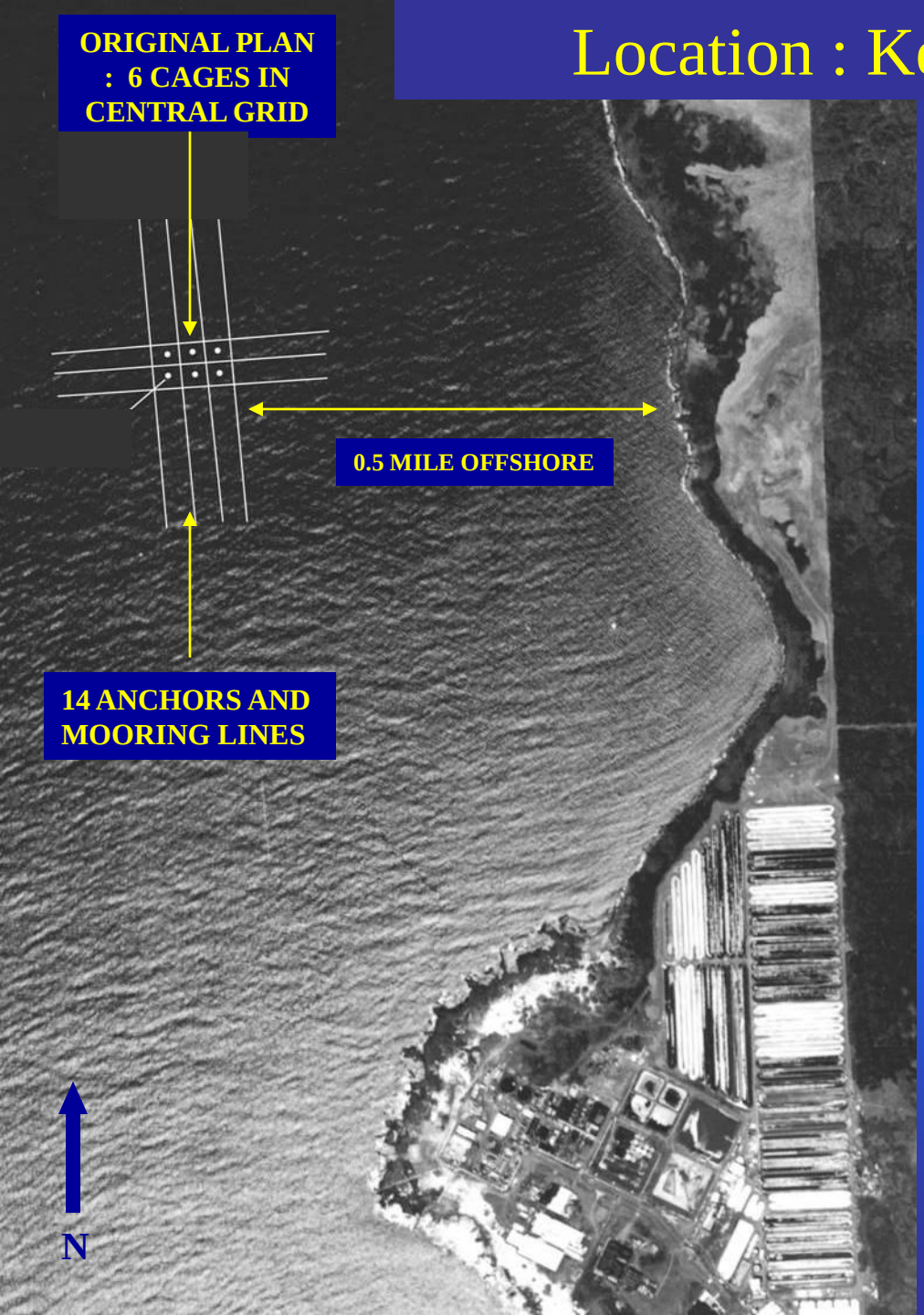
Location : Keahole Point



Kona Blue site attributes :

1. 200 - 220 ft of water
2. 2600 ft offshore (0.8 km)
3. Outside of fishing grounds
4. Beyond diving range
5. Clear of fringing reef
6. Strong currents
7. Sand bottom

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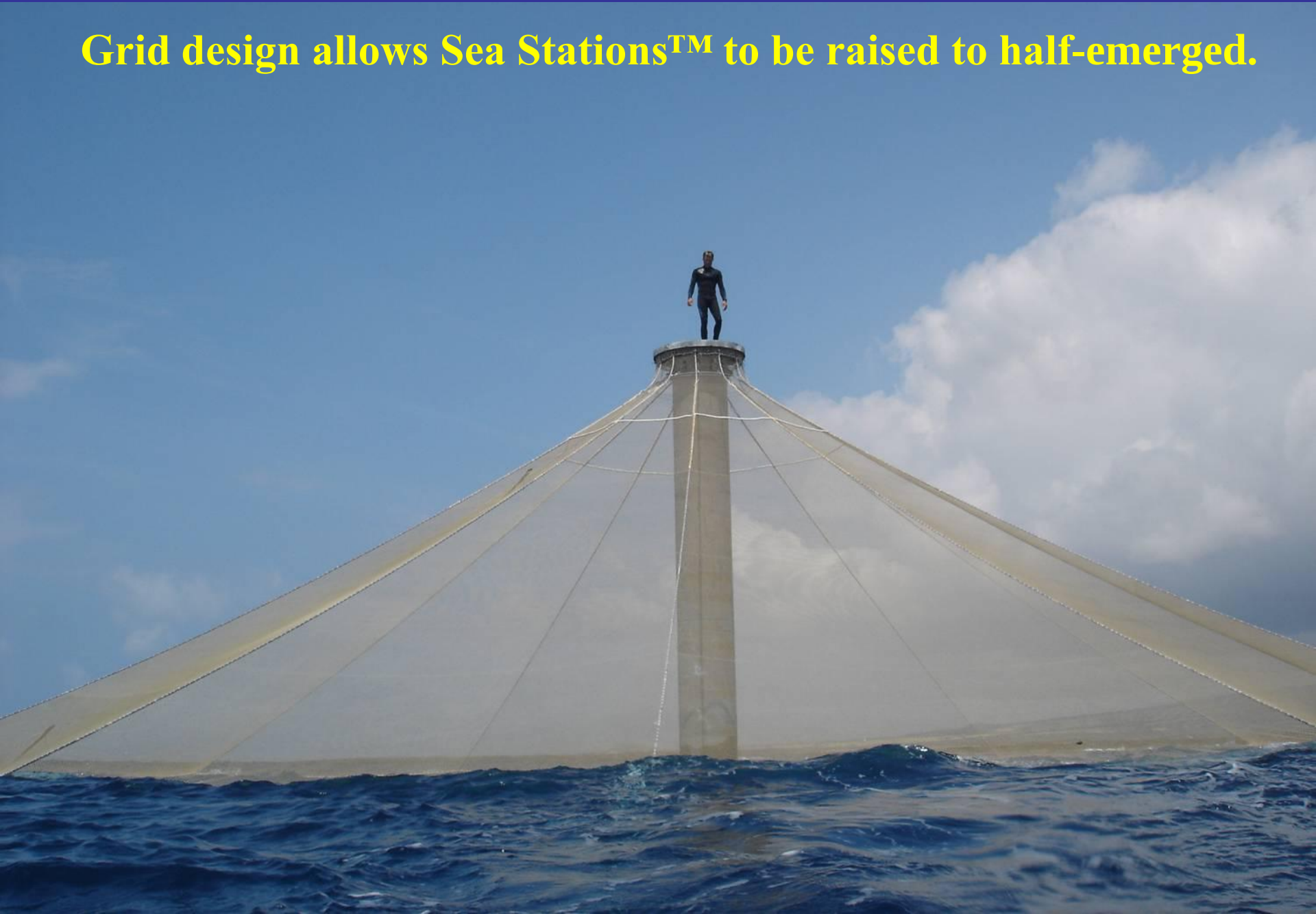
Operations : Eight submersible Sea Station® cages

Grid design allows Sea Stations™ to be raised to half-emerged.



Operations : Eight submersible Sea Station® cages

Sea Station cages are usually submerged around 30 ft below the surface, in the “silent world”.

So far, over 1,000,000 fish stocked in offshore cages

Ongoing monitoring of :

- **fish health,**
- **water quality,**
- **an adjacent coral reef ecosystem (fishes and benthos), and**
- **marine mammal interactions.**

To date: No significant environmental impacts

Presentation:

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Kona Kampachi™ … *Seriola rivoliana*

Native deepwater species

No commercial fishery

Amenable to hatchery culture

Excellent growth rates

Highly efficient feed conversion ratios

Tastes great: Superb sashimi Versatile cooked fillets

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• Fish diet controlled from hatch-to-harvest
• No risk of internal parasites or ciguatera
(such as found in wild kahala)
• Undetectable levels* of Mercury
(* = at sensitivity levels of 50 times FDA's allowable limits)
• Fat levels of over 30 % (dry weight)
• Loaded with heart-healthy omega-3 fatty acids
© Doug Perrine / SeaPics.com

Harvesting up to 25,000 lbs per week.

Roy's

"I like Kona Kampachi® best because it's clean, firm and good for you. …
It pops in your mouth."
Jean-Georges Vongerichten,
Chef, New York City

FIFTH FLOOR

Merriman's
THE AUTHENTIC FLAVORS OF HAWAII

Frontera

FOUR SEASONS
Hotels and Resorts

KONA KAMPACHI™

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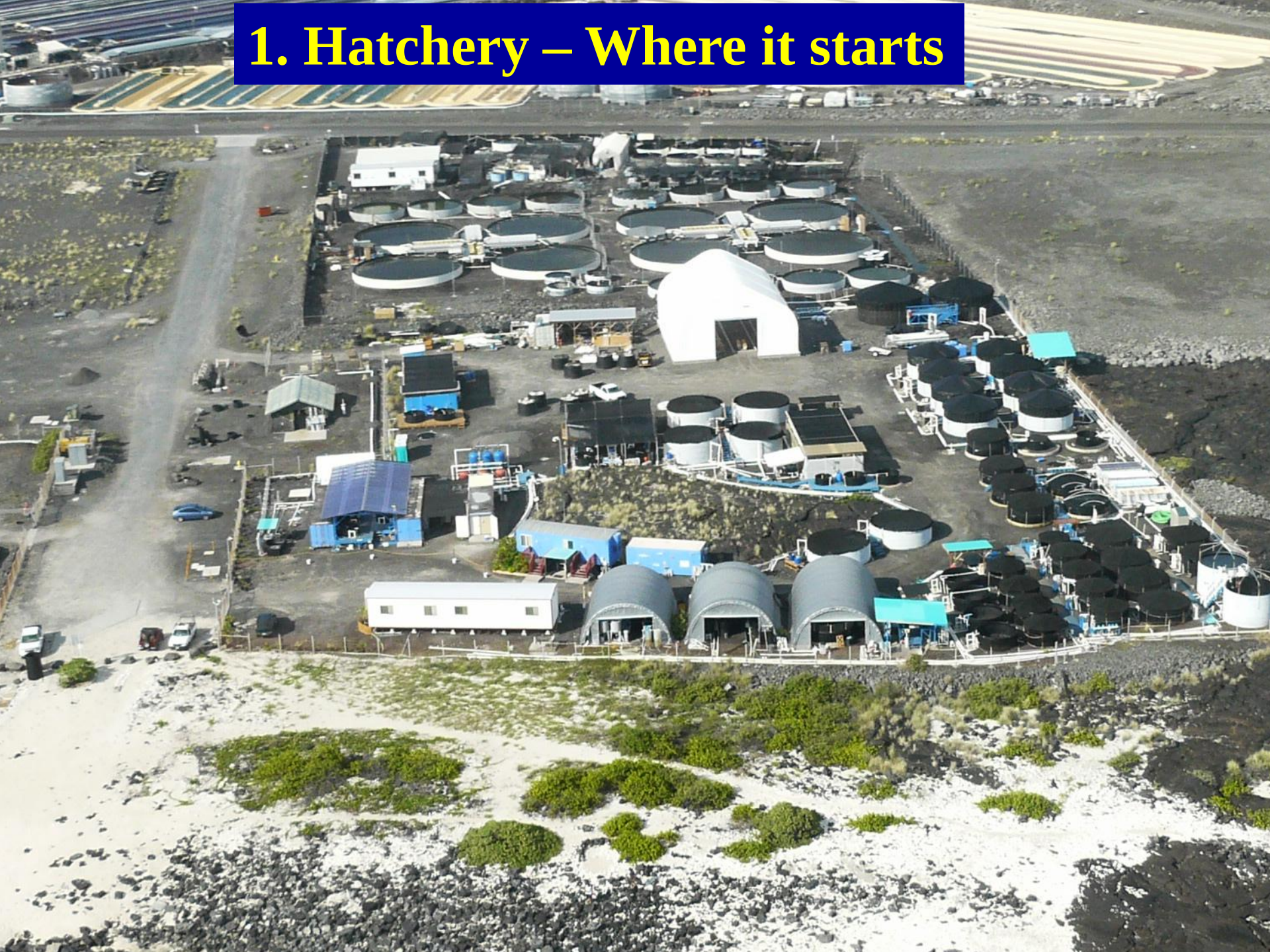
The Quest

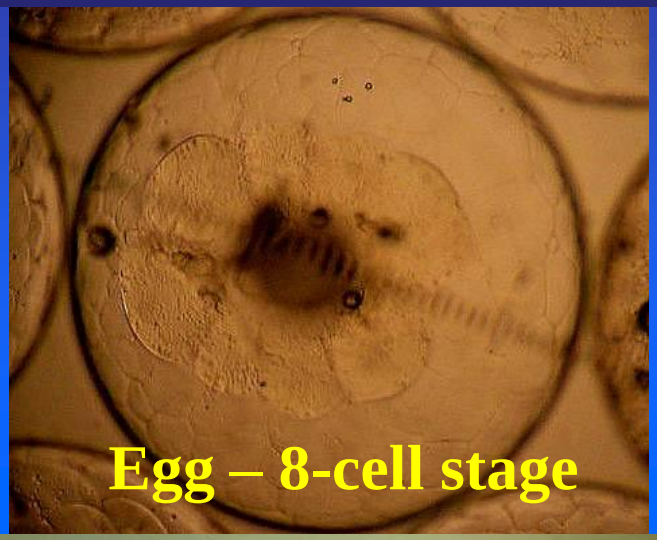
1. Hatchery – Where it starts
2. Permitting – A protracted process
3. Site selection – Spatial solutions
4. Monitoring – Not enough to be green ….
5. Feed – You are what they eat
6. Biotech – Science, not fear
7. Market – A brand to stand behind
8. Ocean Stewards – Striving to get it right

1. Hatchery – Where it starts



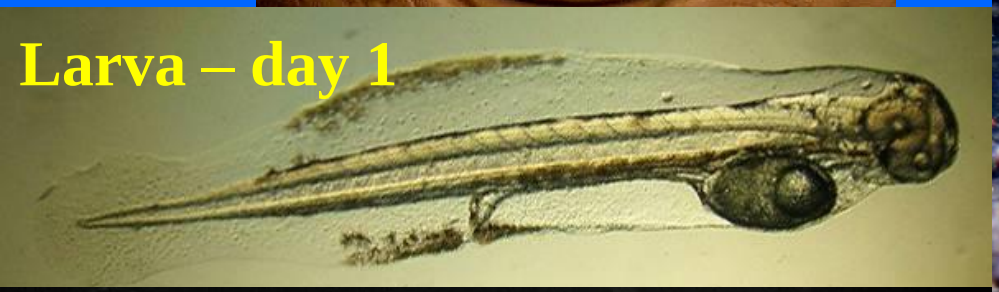
1. Hatchery – Where it starts

The key to sustainability, scalability … and quality

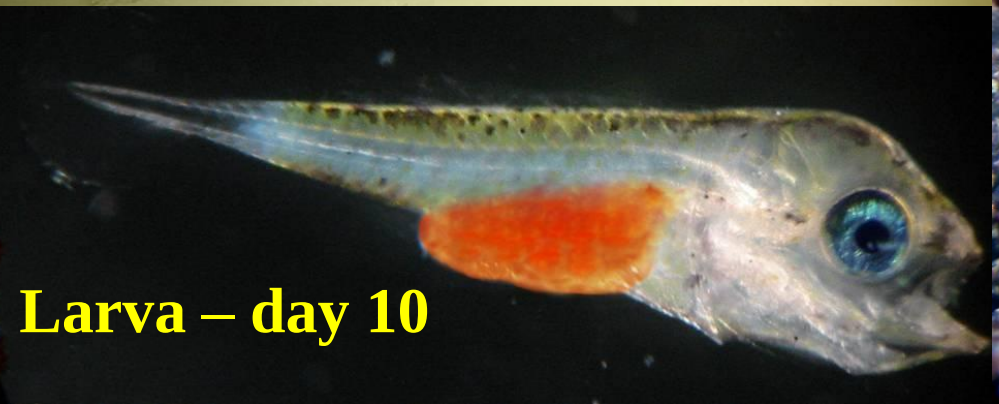


Egg – 8-cell stage

Egg – late embryo



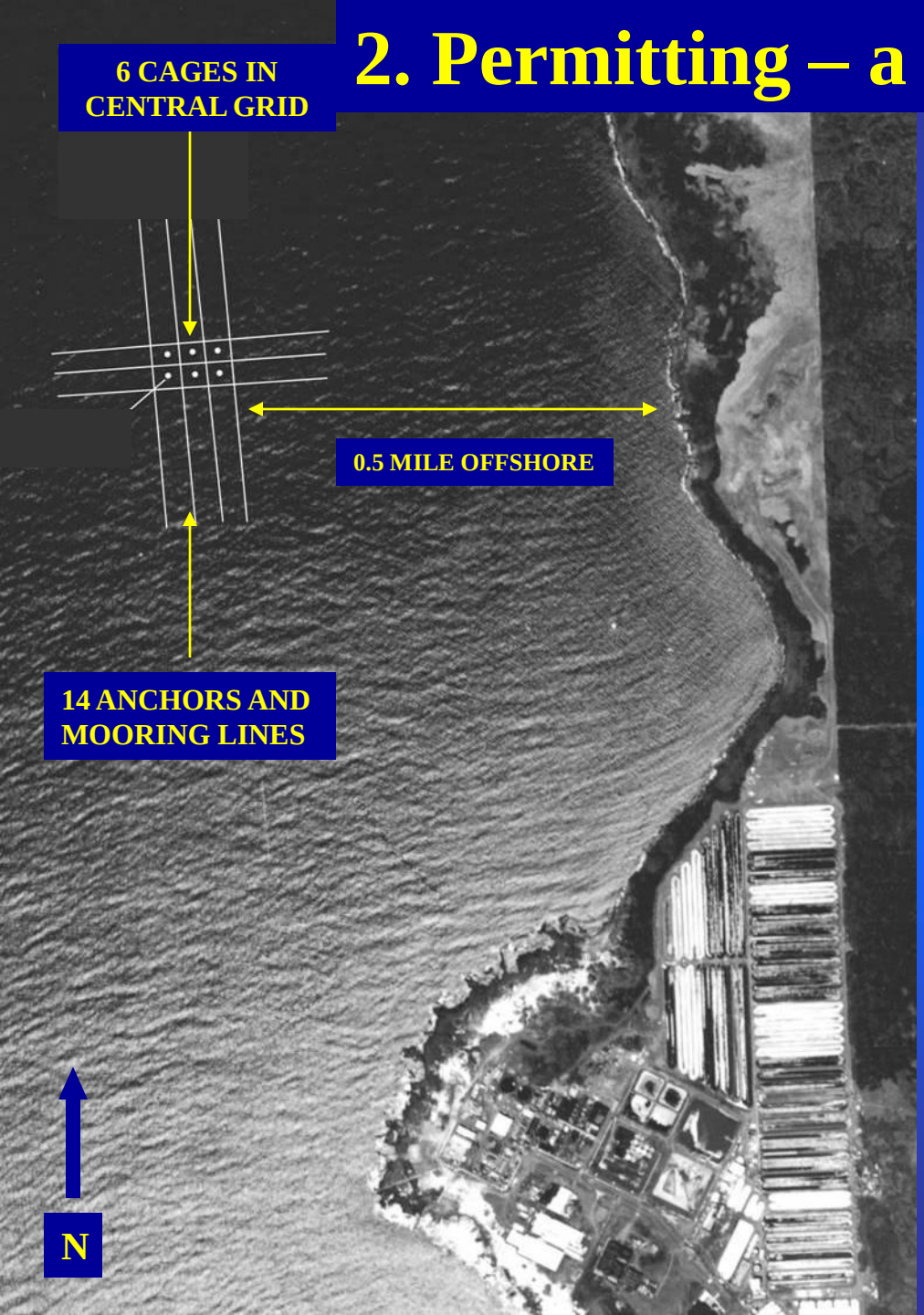
Larva – day 1



Larva – day 10

Larvae– day 20

2. Permitting – a protracted process



Protracted permit process :

1997-98: Revising Hawaii's ocean leasing legislation

2000: First public meetings with Kona community

2003: Filed permit applications

2004: All Federal and State permits in hand

2005 : First cage deployment

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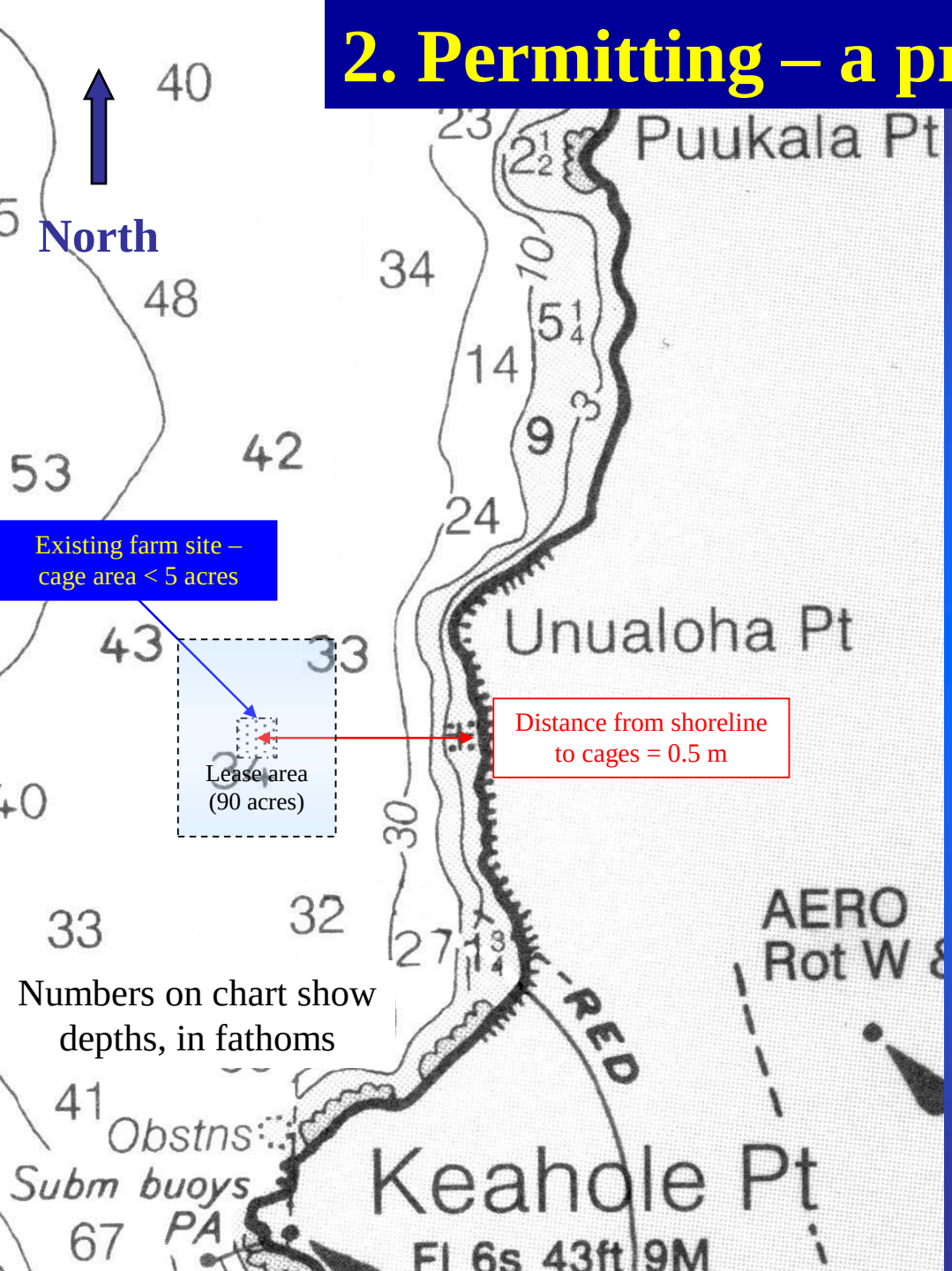
2. Permitting – a protracted process



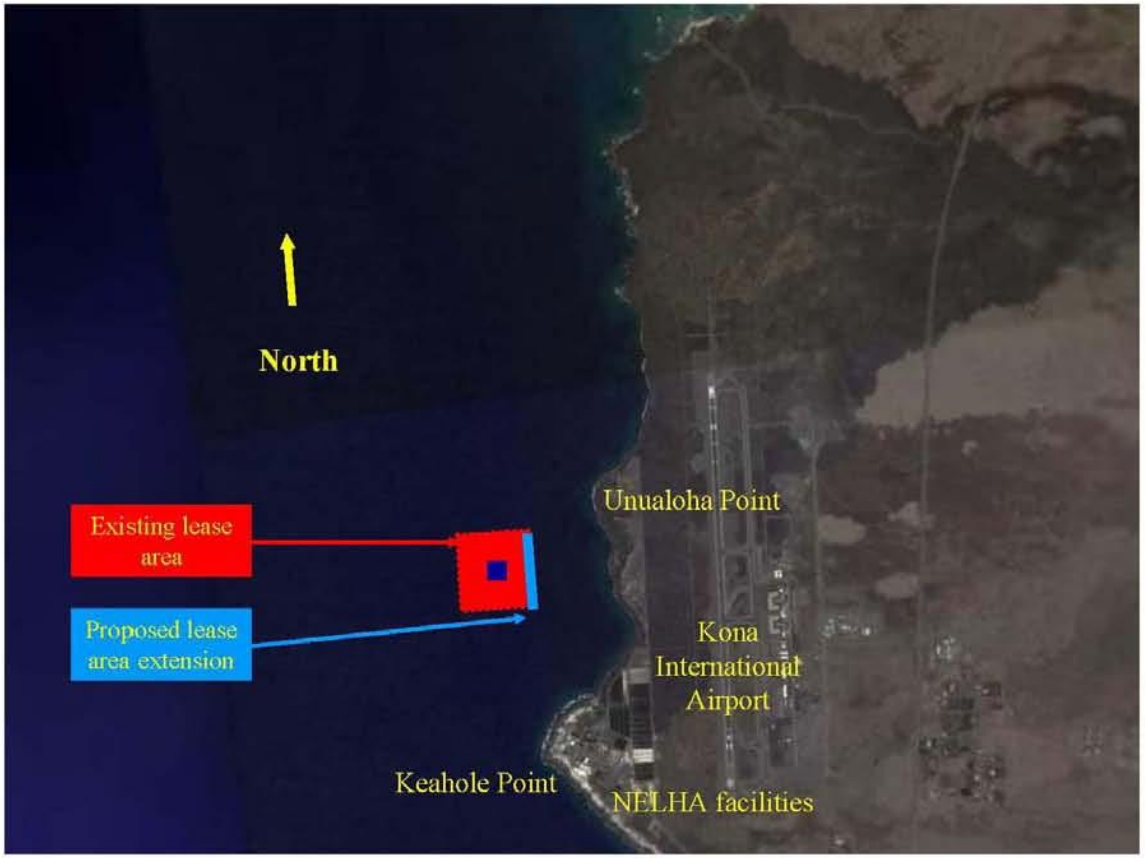
Kona Blue's approach :

1. …included community in early discussions, and throughout the permit process
2. …met extensively with shoreline conservation, cultural and recreational interests
3. …placed draft EA and public comments on our web-site
4. ... took a consultative, conciliatory approach to decision-making.

2. Permitting – vulnerable to vagaries

August, 2007 : Expansion plans:
Convert existing 8 x 3,000 cu m net pens to 8 x 6,000 cu m net pens

Figure 2 a : Aerial photo showing proposed expansion area and existing lease area, relative to the Natural Energy Laboratory (NELHA), Kona Airport, Unualoha Point and Keahole Point.



3. Site selection – spatial solutions

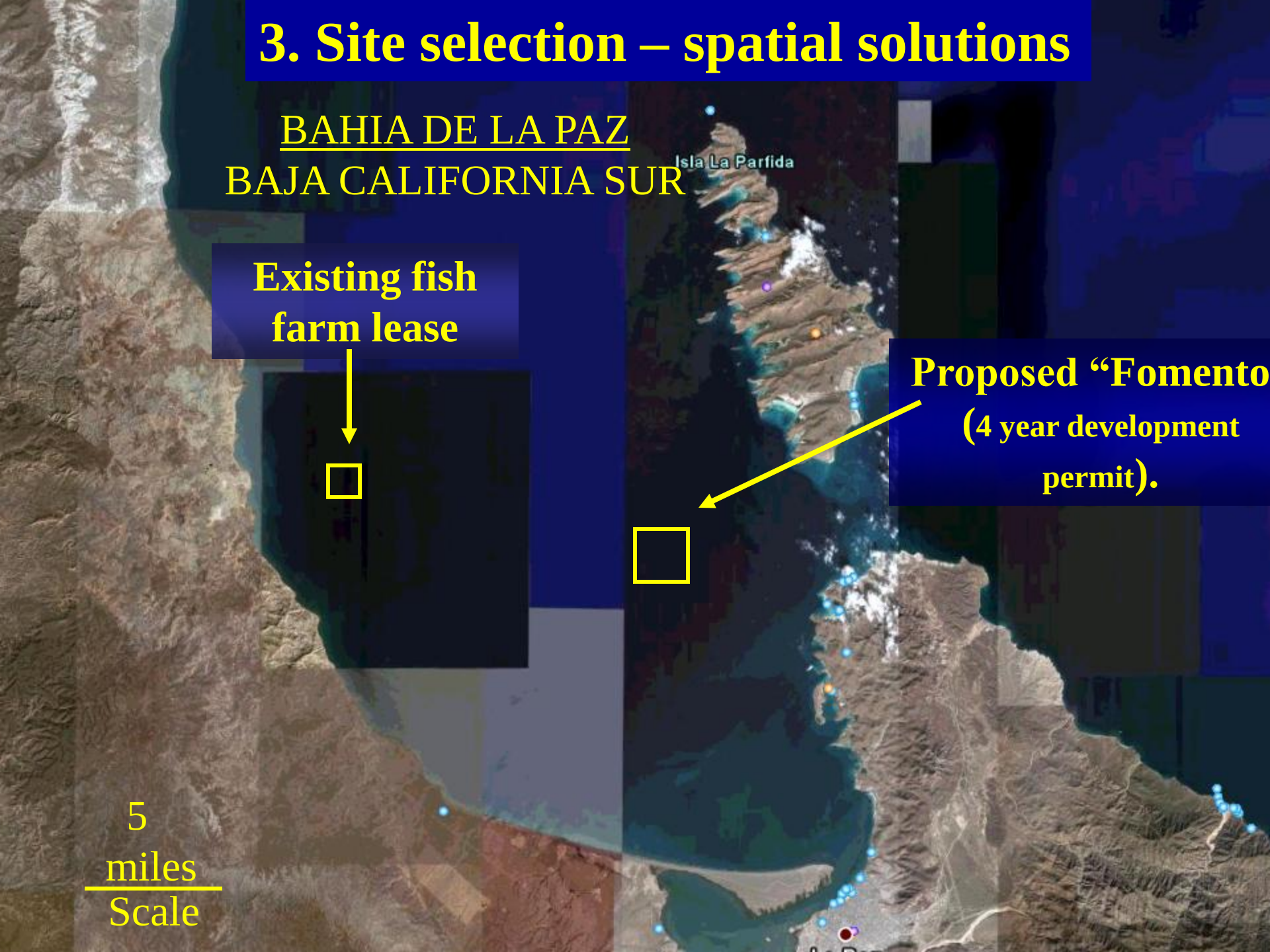
FURTHER! DEEPER!

Mitigating potential impacts

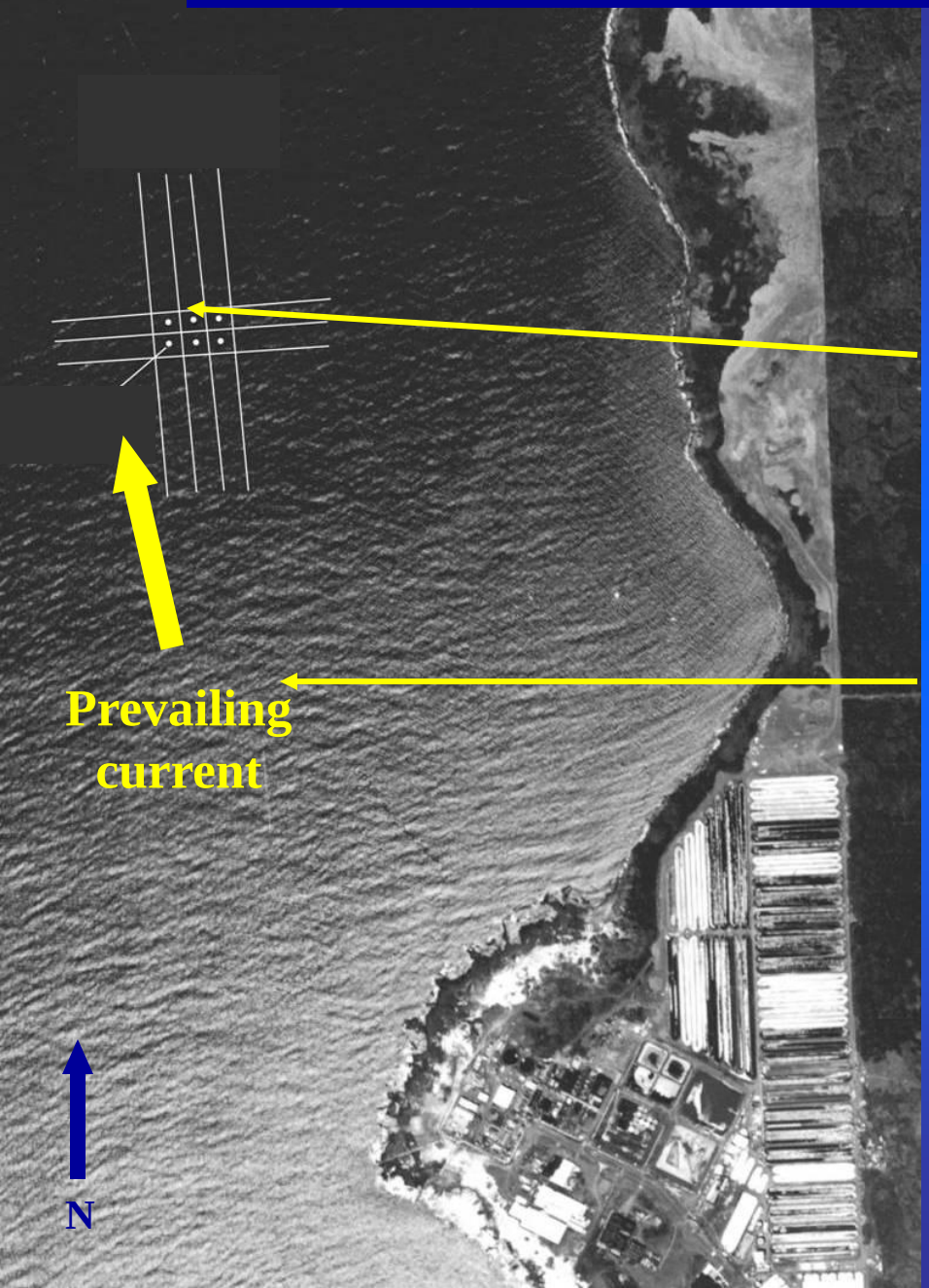
1. Effluent assimilation
2. Current and benthics
3. Escape survival
4. Wild fish interaction
5. Competing user groups

3. Site selection – spatial solutions

3. Site selection – spatial solutions



4. Monitoring – Not enough to be green ….



Kona Blue water quality monitoring sampling sites :

Effluent site: Immediately downcurrent of the cage with highest biomass, one hour after feeding

Control site: Upcurrent of the cages

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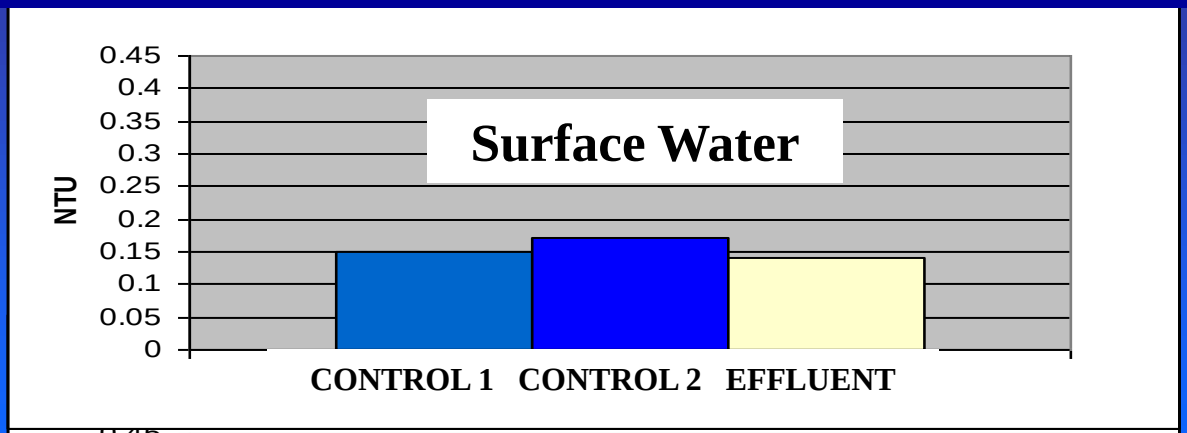
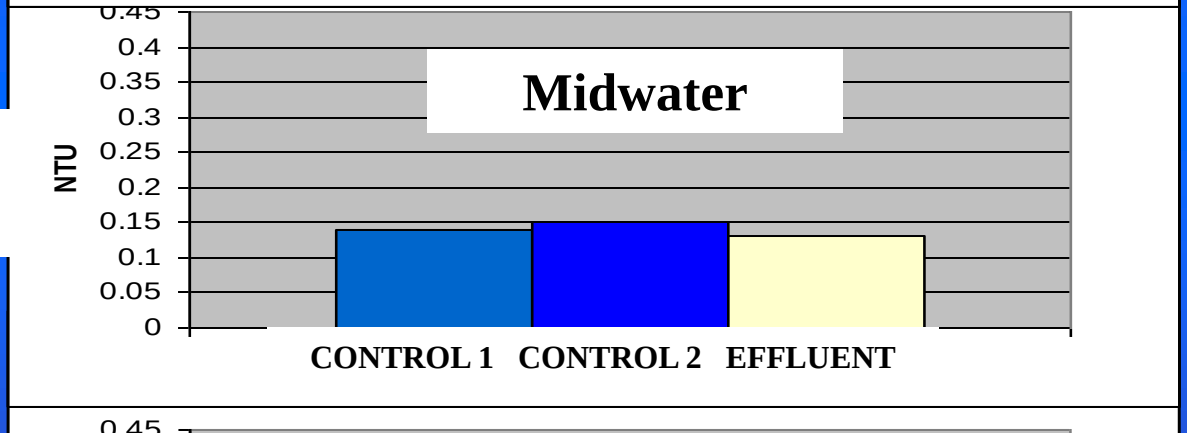
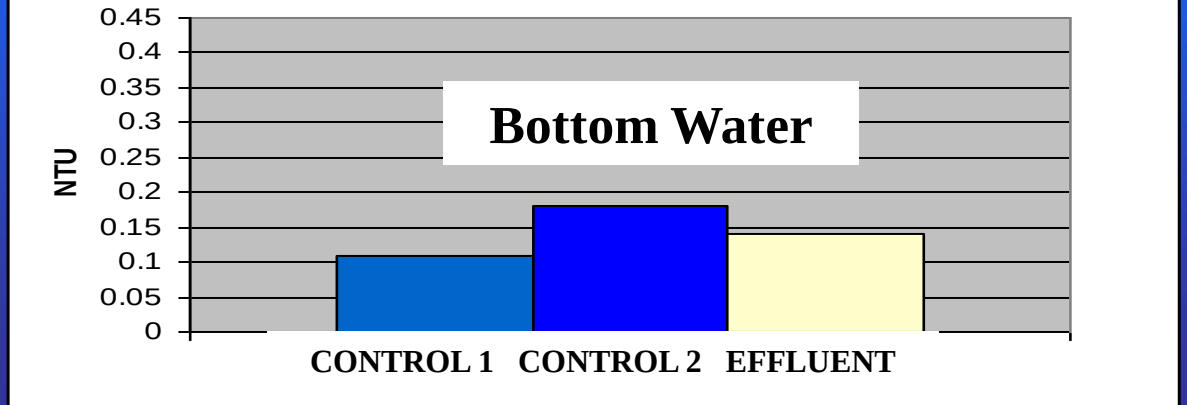
4. Monitoring – … must be *seen* to be green

Critical validation of environmentally sound aquaculture

TURBIDITY (NTUs)







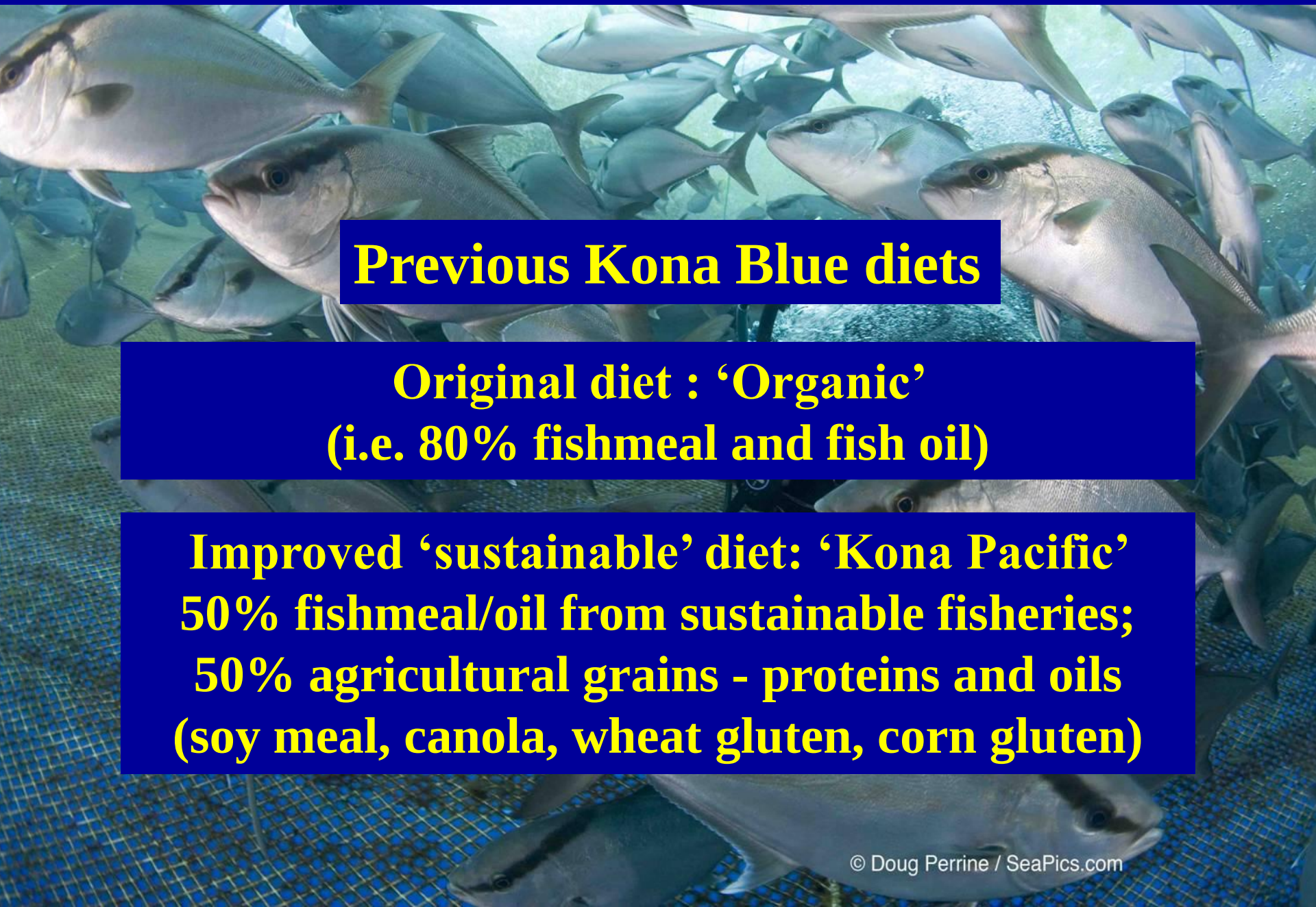
4. Monitoring – … must be *seen* to be green

<u>Third-party validation of "sustainable" open ocean fish farming</u>

Monterey Bay Aquarium's Seafood Watch Program :

US farmed yellowtail (i.e. Kona Kampachi®) = "Good Alternative"

5. Feed – You are what they eat

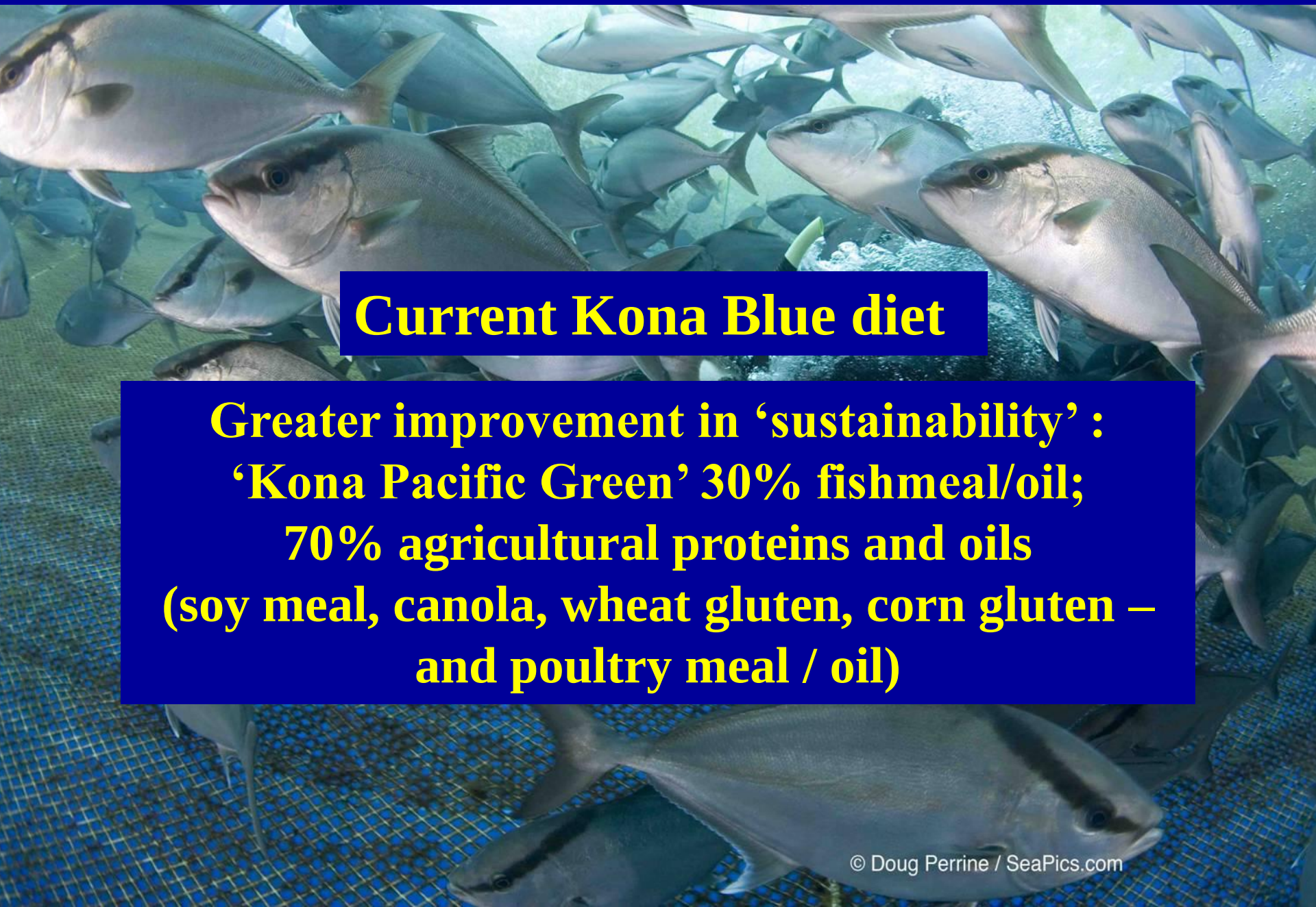


Previous Kona Blue diets

Original diet : 'Organic'
(i.e. 80% fishmeal and fish oil)

Improved 'sustainable' diet: 'Kona Pacific'
50% fishmeal/oil from sustainable fisheries;
50% agricultural grains - proteins and oils
(soy meal, canola, wheat gluten, corn gluten)

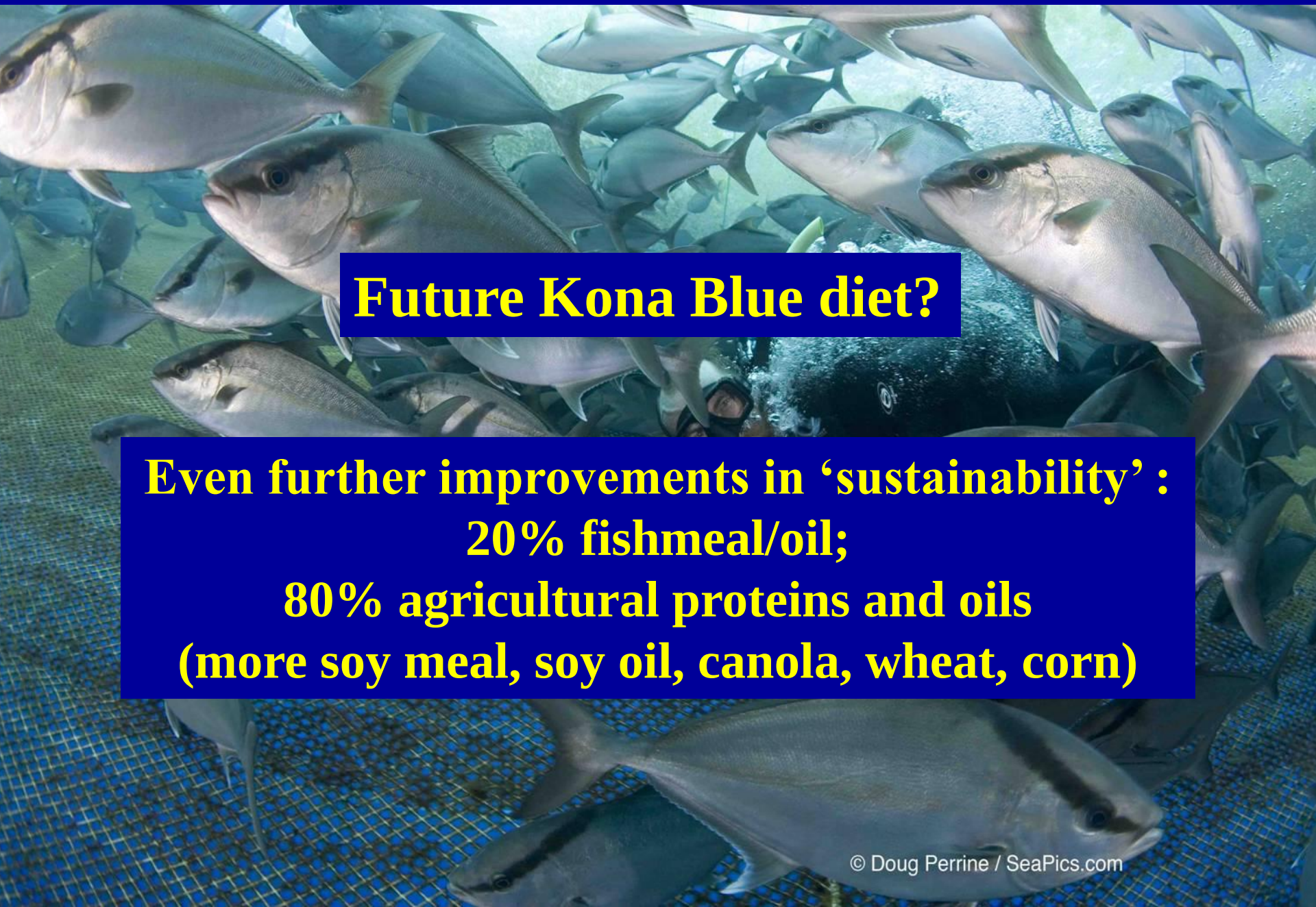
5. Feed – You are what they eat



Current Kona Blue diet

Greater improvement in 'sustainability' :
'Kona Pacific Green' 30% fishmeal/oil;
70% agricultural proteins and oils
(soy meal, canola, wheat gluten, corn gluten – and poultry meal / oil)

5. Feed – You are what they eat



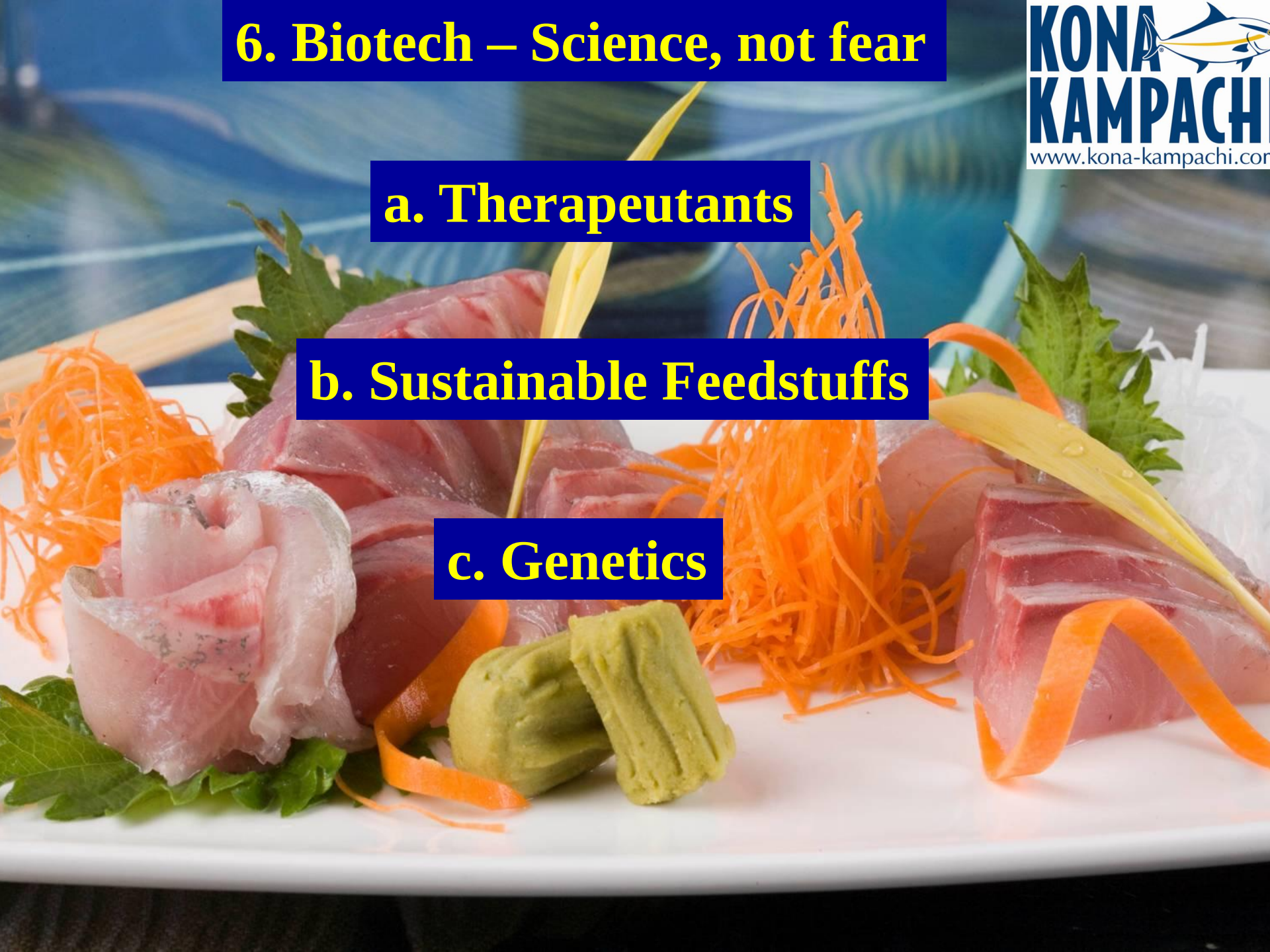
Future Kona Blue diet?

Even further improvements in 'sustainability' :
20% fishmeal/oil;
80% agricultural proteins and oils
(more soy meal, soy oil, canola, wheat, corn)

5. Feed – You are what they eat

Currently testing:

- Two diets – all edible fishery by-products
- No land animal by-products
- FIFO ratio of ZERO
- Acceptable to Whole Foods
- Monterey Bay Aquarium “Best Choice”


6. Biotech – Science, not fear
a. Therapeutants
b. Sustainable Feedstuffs
c. Genetics
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6. Biotech – Science, not fear

a. Therapeutants

i. Fresh water

ii. Peroxide

iii. Antibiotics

iv. Praziquantel

6. Biotech – Science, not fear

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b. Sustainable Feedstuffs

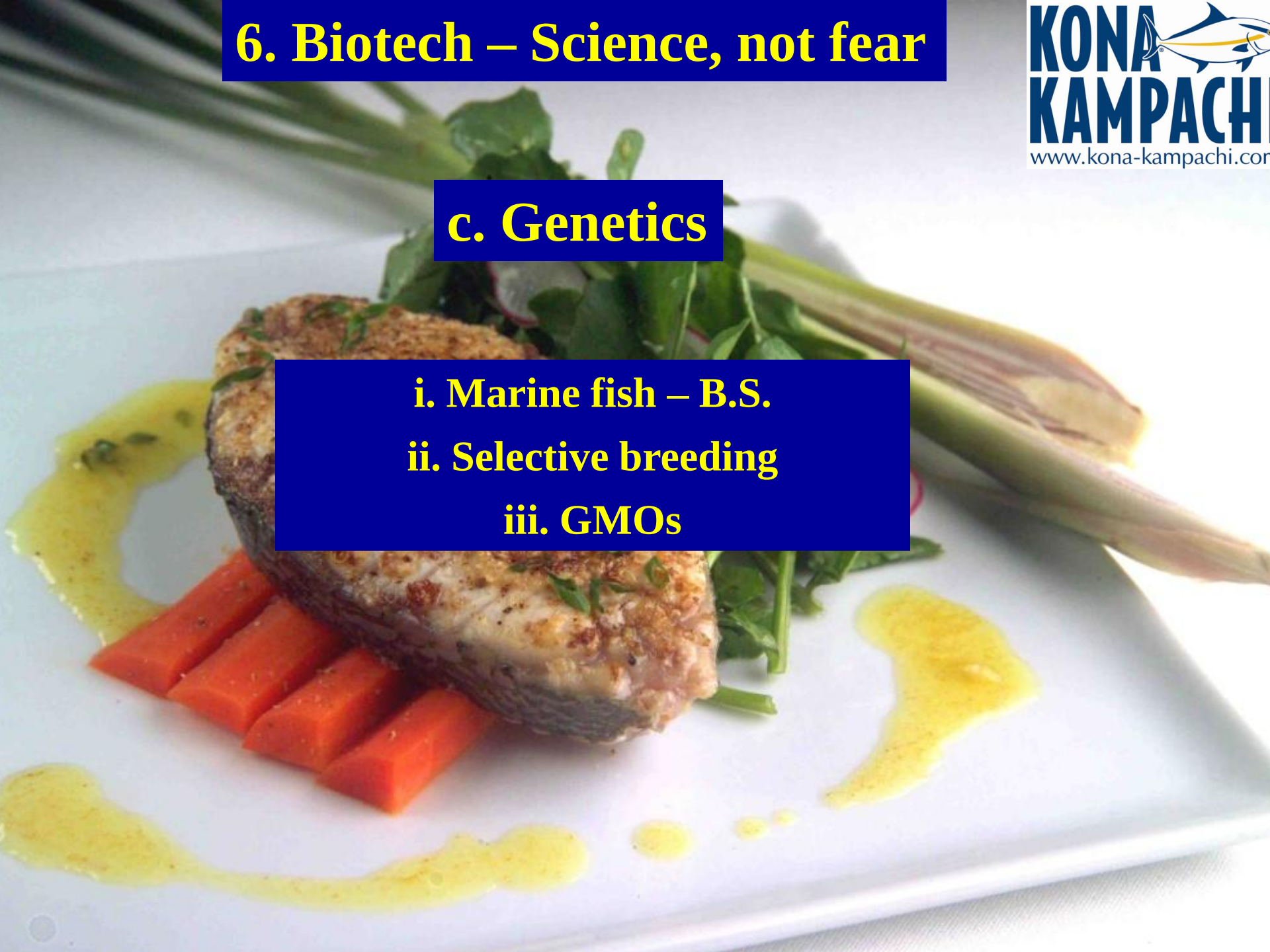
i. Poultry by-products

ii. Mammalian renderings

iii. Edible fishery trimmings

iv. Soy proteins and oils

6. Biotech – Science, not fear



c. Genetics

i. Marine fish – B.S.

ii. Selective breeding

iii. GMOs

7. Market – A brand to stand behind

KONA KAMPACHI™

Sustainably Delicious

7. Market – A brand to stand behind

The exemplar of all that ocean culture could be ….

….and should be!

8. Ocean Stewards – striving to get it right

8. Ocean Stewards – striving to get it right

Mission :

To represent and work towards the best use and management of the open oceans, meeting the increasing demand for healthful seafood, through appropriate balancing of the expansion of environmentally sound open ocean aquaculture, with protection of open ocean resources and habitats.

OCEAN STEWARDS
INSTITUTE

Industry experience in good practice: responsible Open Ocean Mariculture

Contact Neil, at 1 (808) 989 2438, or neil@kona-blue.com

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